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Describes the engineering procedures required for approval and certification for airdrop of explosive-loaded materiel during development and/or customer tests.

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U.S. ARMY TEST AND EVALUATION COMMAND
TEST OPERATIONS PROCEDURE

AMSTE-RP-702-108
*TOP 4-2-509
AD No. A216309

31 July 1989

AIRDROP QUALIFICATION OF EXPLOSIVE MATERIEL

1. SCOPE. This TOP describes the testing procedures required for approval and certification for airdrop of explosive-loaded materiel during development and/or customer tests. Appendix A provides further background information.

2. FACILITIES AND INSTRUMENTATION.

2.1 Facilities.

Item	Requirement
Parachute packing facility	To pack all types of cargo and personnel parachutes used in airdrop operations
Parachute maintenance facility	To perform organizational, direct, and general support levels of maintenance for parachutes and airdrop equipment
Airdrop load preparation facility	To accommodate the assembly of airdrop platforms, airdrop load buildup, weighing of rigged loads, and storage of airdrop rigging equipment and tools

*This TOP supersedes TOP 4-2-509 dated 1 November 1972.

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Item (cont'd)	Requirement
Airfield facility	To accommodate cargo aircraft
Instrumented drop zones	A specified area upon which airborne troops and equipment loads are air-dropped from designated aircraft. Drop zones must meet the criteria listed in USAF MAC Regulation 3-3[1], Mission Employment Tactics. Instrumentation equipment to record airdrop load velocities, event, and acceleration data
Firing ranges	To accommodate firing or other functioning of explosive-loaded materiel that has been airdropped
Industrial x-ray facility	To perform radiographic inspections to applicable specifications for materiel being tested
Photographic facility	16-mm, 35-mm motion, video, and still cameras with range timing, to record airdrop load behavior, space position data, rigging procedures, and airdrop event data
Meteorological facility	To record wind speed, wind direction, relative humidity, and temperatures as required
Calibration facility	To calibrate test measuring devices
Data reduction facility	Hardware and software required to reduce raw data obtained from cine-theodolite tracking cameras, video tracking cameras, laser and radar tracking equipment, and telemetry transmitted data into usable information. To provide plots and graphs for vertical velocity versus time, corrected to standard atmosphere and to standard atmosphere at sea level; also plots for horizontal displacement parallel to the aircraft path versus the horizontal displacement perpendicular to the aircraft flight path, smoothed and corrected to standard atmosphere

1/ Superscript numbers and letters match references in appendix B.

Item (cont'd)	Requirement
Motor pool and heavy equipment maintenance facility	To provide and maintain cranes, aircraft loaders, forklifts, and recovery vehicles
Communications and radio equipment maintenance facility	To provide and maintain radio for communication from ground-to-air, support vehicles, and data collection units
Telemetry (TM) instrumentation and ground station receiving facility	To fabricate, install, and operate TM packages; and record force, acceleration, vibration, shock and inertial measurement data

2.2 Instrumentation.

Devices for Measuring	*Permissible Error of Measurement
Scales, 60,000-lb capacity	±1.0 %
Shock recording transducers*	±5.0 %

(NOTE: Force and shock recording transducers normally require TM equipment including signal amplifier/oscillators, radio frequency signal transmitter, tunable signal receivers, magnetic tape recorder, piezo-electric accelerometers, acceleration sensors, and azimuth and elevation TM tracking antennas.)

Space position vector instrumentation	±6.0 m
Space velocity instrumentation	±1.5 m/s

(NOTE: Space position vector and velocity instrumentation require varying degrees of computer data reduction depending on the system (photo-optical, video, cinetheodolites, laser or radar). Errors vary depending on the specific instrumentation and the distances and angles involved.)

Meteorological data:	
Wind speed and direction	0-45 m/s, ±1 m/s
Ambient temperature	-35 °C to ±50 °C, ±2 °C
Relative humidity	5 % to 100 %, ±1 %
Visibility	
Range time	±0.001 s
Projectile velocity	±0.15 %
Weapon pressure	±2.0 %

*The permissible error of measurement for instrumentation is the two-sigma value for normal distribution; so the stated errors should not be exceeded in more than one measurement of 20.

Devices for Measuring (cont'd)	*Permissible Error of Measurement
Recoil velocity	±5.0 %
Integrity of projectile parts	As required
Devices specified for the firing of explosive-loaded items in the test procedures shown in the applicable TOP from the series beginning with the number 4-	

3. REQUIRED TEST CONDITIONS.

a. Ensure that the materiel airdropped according to this TOP has a prior safety release.

b. Conduct airdrop of explosive materiel after successful completion of safety tests, e.g., 12-meter drop test of packaged items, 3-meter drop test of unpackaged items, sequential rough-handling test, vibration tests, pressure tests, and cook-off tests. The results of such safety tests are the bases for issuing a safety release for airdrop testing.

c. Ensure that the materiel developer has provided a safety assessment report to include fragmentation/blast data of each test item at least 60 days before the start of tests in compliance with AR 385-16[2].

d. The materiel developer must determine the types and methods of airdrops required for each test item. This is commensurate with the tactical deployability requirements of using units, the operational mode summary/mission profile, and the packaging of the test items. The normal types of airdrop each test item is subjected to include low-velocity, high-velocity, and low-altitude parachute extraction (LAPE). A minimum of three parachute malfunction airdrop tests (freefall) are required if the test items are to be airdropped by LAPE method. The requirements for special-purpose methods of air delivery, such as high-altitude airdrop resupply system (HAARS), high-speed low-level airdrop system (HSLLADS), special operation combat expendable platform (SOCEP), bundle delivery system (WEDGE), and personnel airdrops, must be coordinated with the U.S. Army Natick Research, Development and Engineering Center (NRDEC) to determine the feasibility and possibility of conducting these types of tests.

e. Ensure that the materiel developer has obtained detailed airdrop rigging procedures for items to be airdropped from NRDEC, ATTN: STRNC-UAS, Natick, MA 01760-5000, in compliance with AR 70-47[3].

f. Review and consider the following TOPs/ITOPs when formulating an engineering test plan:

TOP/ITOP Number	Title
1-1-012[4]	Classification of Deficiencies and Shortcomings
1-2-500[5]	Transportability
1-2-511[6]	Electromagnetic Radiation Effects and/or Hazards Test
3-1-002[7]	Confidence Intervals and Sample Size
4-2-502[8]	Safety Evaluation of Mines and Demolitions

TOP/ITOP Number	Title (cont'd)
4-2-504[9]	Safety Testing of Artillery, Mortar, and Recoilless Rifle Ammunition
4-2-504(1)[10]	Safety Testing of Field Artillery Ammunition
4-2-504(2)[11]	Safety Testing of Tank Ammunition
5-2-619[12]	Safety Testing of Missiles and Rocket Systems
7-2-506[13]	Airdrop Systems Safety
7-2-509[14]	Airdrop
7-2-512[15]	Simulated Airdrop Test - Weapons and Individual Equipment

Specific test procedures may be found in the TOP 4-series (Ammunition and Explosives), and in the 7-series (Aviation, Air Delivery Equipment, and Aircraft Weapons Subsystems). Documents prepared for service test procedures, if available, contain information of interest for engineering test planning.

g. Ensure that the materiel developer has provided the installation commander with procedures and requirements necessary for safe demilitarization or disposal of hazardous items in compliance with AMC Supplement to AR 385-16.

h. Obtain approval from U.S. Air Force Military Airlift Command, ATTN: XPT to conduct airdrop tests of explosive-loaded material from U.S. Air Force cargo aircraft in accordance with ASD-TM-ENE-77-1[16], Criteria For Nonstandard Airdrop Loads. Information/data required prior to requesting Air Force approval to conduct airdrop tests include results of electromagnetic radiation (EMR) hazard test and electrostatic discharge (ESD) tests of ordnance subsystems for inadvertent ignition or dudding caused by any forms of electromagnetic or electrostatic energy. The term ordnance includes weapons, rockets, explosives, electroexplosive devices, squibs, flares, igniters, explosive bolts, destruct devices, JATO bottles, etc. Reference MIL-STD-461B[17], MIL-STD-1512[18], MIL-E-6051E[19], and TOP 1-2-511. Also required are detailed airdrop rigging procedures, test item hazard data, and separation required between detonation point and aircraft to preclude any possibility of damage/injury from fragmentation/blast.

i. Ensure that materiel developer has provided an environmental assessment (EA) before airdrop testing in compliance with AR 200-2[20].

j. Ensure that materiel developer has provided classification guidance before airdrop testing in compliance with AMC Supplement to AR 380-5[21].

k. In determining test item sample size, the quantity of test items required is dependent on how the items are packaged and the type of airdrop tests to be conducted. Data required to determine quantities are the length, width, height, and weight of their shipping container and the quantity of test items contained therein. This allows the determination of the quantity of containers/test items that will be required for any one airdrop load configuration. A minimum quantity of test items required is 20 percent of the total load contents. Normally, empty test item containers are ballasted with sand or inert material to shipping weights and used to complete airdrop load buildup. It is essential that airdrop load configurations and airdrop rigging procedures be determined early in test planning efforts to allow determination of test item sample size.

l. Ensure the following actions have been taken:

(1) Support personnel have been briefed on the test objectives, procedures, safety, and security.

(2) Personnel have been trained using the training manuals, technical publications, and loading procedures appropriate to the aircraft, type of explosive (and its hazard), rigging to be used, and applicable airdrop and postdrop procedures.

m. Ensure that facilities and instrumentation are ready to function and scheduled for operation.

n. Initial Inspection Checklist.

(1) Ensure that a current safety assessment showing the suitability of the test item for airdrop is available.

(2) Inspect the test items as received to ensure that they are safe to handle, transport, rig, arm, and disarm. Ensure that the items are complete and ready for test.

(3) Perform a preoperational inspection of the test items in accordance with the approved test plan.

4. TEST PROCEDURES. Four subtests are required for the test and evaluation of explosive materiel for airdrop capability: Initial inspection, rigging, airdrop, and postdrop evaluation.

4.1 Initial Inspection Subtest.

4.1.1 Method.

a. Visually inspect the packaging and test items upon receipt of the test items. Measure and weigh the item as packaged; take still photographs of both the packaged and unpackaged test item. Remove each test item from its container and subject each to a radiograph examination, where applicable, following procedures provided by the developer. If the test items are not serial numbered when received, assign them. Record this data.

b. Record, photograph, and report any shortages, damages, or deformations. Repackage serviceable and complete test items in their original containers. Report unserviceable items to explosive ordnance disposal (EOD) personnel for disposition instructions.

4.1.2 Data Required. Record the following:

a. Description of test item packaging

b. Length, width, and height of inner and outer packaging ($\pm$0.01 m)

c. Weight of packaging and of the unpackaged test item ($\pm$0.23 kg)

d. Quantity of test items contained in their shipping containers

e. Record of any damage, deformation, and missing components found

f. Still photographs

g. Radiographic photographs

4.2 Rigging Subtest. The objective of this subtest is to accumulate physical data on the load in the predrop condition, using conventional rigging procedures.

4.2.1 Method.

a. Rig the test items following procedures provided by NRDEC and approved by USAF Military Airlift Command (HQ, MAC).

b. Take still photographs of the load buildup and of the completely rigged load.

c. Install data collection devices as dictated by the detailed test plan data requirements (accelerometers, strain-links, TM packages, batteries, cameras, transponders, etc).

d. Coordinate and approve changes required to the rigging procedures with NRDEC and HQ, MAC.

4.2.2 Data Required. Record the following:

a. Changes made to the rigging procedures

b. Rigged load length, width, and height to include the cargo parachutes ($\pm$0.01 m)

c. Rigged load weight to include the parachutes ($\pm$0.23 kg)

d. Horizontal center of balance of the rigged load ($\pm$0.01 m)

e. Vertical center of balance of the rigged load ($\pm$0.01 m)

f. Type and quantity of cargo parachutes used

g. Quantity of test items contained in each rigged load

h. Description of data collection equipment installed on the rigged load

4.3 Airdrop Subtest. The objective of this subtest is to determine the ability of the test item (when rigged, loaded, and airdropped using standard and conventional equipment and techniques) to withstand the impact forces and to be capable of safe handling and satisfactory performance after airdrop. The standards to be used include the safety and performance evaluations, as required by the materiel needs document, customer agency, and local procedures.

4.3.1 Method.

a. Airdrop low-velocity, high-velocity, and intentional parachute malfunction loads from a USAF cargo aircraft. USAF cargo aircraft may be used if specifically required by the detailed test plan. The aircraft drop altitude above ground level (AGL) will be higher than the fragmentation distance and range safety fan of the test items being airdropped but not lower than 1,200 ft AGL. The aircraft drop speed will be from 130 to 150 knots indicated (KIAS).

b. Conduct low-altitude parachute extraction (LAPE) method of airdrop from a cargo aircraft from an altitude of 5 to 10 ft AGL, flying at 130 KIAS.

c. Follow procedures on aircraft loading, load restraint, and load release from the aircraft contained in the USAF technical orders (Dash 9) for each type of aircraft. (See appendix B for informational references.)

d. Use acceleration sensors or strain-gage type accelerometers on the low-velocity, high-velocity, and LAPE airdrop loads to record impact accelerations. Use cinetheodolite tracking cameras on the low- and high-velocity airdrops, and video cameras on the LAPE airdrops to obtain trajectory and velocity data. Use ground-to-air, 16-mm motion cameras to document load behavior and orientation from the time the test items leave the aircraft to ground impact. Record range time using the interrange instrumentation group b (irig-b) format of 1,000 pulses per second on all cameras to provide a common time base for all data obtained. Take still photographs before and after drop of the rigged loads and any damage. Record meteorological data at the time of day that each airdrop test is conducted.

e. Visually inspect the test items after each low-velocity, high-velocity, and LAPE airdrop test. Record the results. Subject serviceable test items to a postdrop evaluation. EOD personnel will destroy unserviceable test items and those subjected to intentional parachute malfunction airdrop on the DZ.

4.3.2 Data Required. Record the following:

a. Type and method of airdrop

b. Ground-to-air motion photographs

c. Still photographs

d. Meteorological data

e. Space positioning and trajectory data for low- and high-velocity airdrops:

(1) Aircraft release velocity ($\pm$0.3 m/s)

(2) Aircraft release altitude ($\pm$0.3 m)

(3) Azimuth direction of aircraft flight at release ($\pm$1 ^{o}GN)

(4) Load extraction time (±0.5 s)

(5) Parachute deployment time (±0.5 s)

(6) Parachute opening time (±0.5 s)

(7) Load stabilization time (±0.5 s)

(8) Vertical displacement (±1.5 m)

(9) Vertical velocity (±0.3 m/s)

(10) Horizontal velocity at impact (±0.3 m/s)

(11) Resultant impact velocity (±0.3 m/s)

(12) Total drop time (±0.5 s)

f. Trajectory and velocity data for LAPE airdrops:

(1) Aircraft ramp height at time of load extraction (±0.15 m)

(2) Aircraft wheel height at time of load extraction (±0.15 m)

(3) Aircraft ramp attitude at time of load extraction (±1 °)

(4) Platform attitude at impact (±1 °)

(5) Platform rotation from extraction to impact (±1 °)

(6) Extraction velocity of the load (±0.15 m/s)

(7) Vertical impact velocity of the load (±0.15 m/s)

(8) Aircraft velocity at time of load extraction (±0.15 m/s)

(9) Slide distance of the load (±0.15 m)

g. Force and acceleration data as required by the detailed test plan.

4.4 Postdrop Evaluation Subtest. The objectives of this subtest are to determine if the test item is safe to handle and remove from the DZ by conventional carrier and if it will function as designed. That is: Did airdrop affect the safety or functioning characteristics of the test item? The standards are the safety and performance requirements as stated by the materiel needs document, local requirements, and customer agency. If these requirements are not stated, production acceptance criteria for the test item may be used.

4.4.1 Method.

a. Observe airdropped loads (using binoculars) from a distance that exceeds the test item fragmentation distance and safety fan. Observation times will be determined by the project engineer and will vary with the type of items airdropped. This data can be obtained from the safety assessment

report. If smoke, flame, or evidence of item detonation is not observed, the normal observation time is 15 min. If flame, smoke, or a detonation is observed, all personnel will be kept from the impact area until the smoke or flame is no longer visible.

b. EOD personnel will initially inspect the loads and impact area. When they declare the area safe to enter, photograph and de-rig the load(s) and visually inspect the load contents. Remove serviceable test items from the DZ and subject them to a radiographic examination before being fired. EOD personnel will destroy unserviceable test items on the DZ following procedures provided by the project engineer.

4.4.2 Data Required.

a. Still photographs of the airdropped loads and their contents

b. Damage sustained to the airdrop rigging equipment and parachutes

c. Condition of the test items

d. Record of the number of test items destroyed and those that survived airdrop

5. DATA REQUIRED. Included in each subtest in 4. above.

6. PRESENTATION OF DATA. Correlate the data analysis and evaluation of load/item performance with information related to rigging, descent, and impact parameters.

The hazard (or lack thereof) of the explosive materiel resulting from being subjected to intentional malfunction drops is the primary factor in the evaluations which lead to the development of criteria for a safety release. These evaluations also are the bases for special rigging procedures, if required, to prevent explosive functioning in the field as a result of fouled parachutes or other inadvertent malfunctions. Applicable rigging procedures, warnings, etc, developed during these tests are necessary for inclusion in the applicable technical manual on airdroppable ammunition (TM 10-500 series) for field use.

Forward comments, recommended changes, or any pertinent data which may be of use in improving this publication to Commander, U.S. Army Test and Evaluation Command, ATTN: AMSTE-TC-M, Aberdeen Proving Ground, MD 21005-5055. Technical information may be obtained from the preparing activity: Commander, U.S. Army Yuma Proving Ground, ATTN: STEYP-MT-I, Yuma, AZ 85365-9103. Additional copies are available from the Defense Technical Information Center, Cameron Station, Alexandria, VA 22304-6145. This document is identified by the accession number (AD No.) printed on the first page.

APPENDIX A

BACKGROUND

The aerial delivery by parachute of materiel, including munitions and other explosive-loaded ordnance, is an essential military requirement to supplying field forces. The results of an adequate airdrop test of explosive materiel will form the basis for decisions regarding the suitability of the item for airdrop, rigging, and delivery techniques, and for postdrop performance data on the item. To obtain the maximum amount of information for field use, it is essential that all operational conditions during the airdrop be recorded and evaluated.

Changes in the design of containers and parachutes affect the methods of rigging loads for airdrop. The newer methods of delivery tend to favor bulk loads of ammunition on pallets to reduce weight and volume. The orientation of the explosive item in the package as manufactured is often contrary to the optimum attitude for airdrop. This situation may create a hazard at or after impact if the item is airdropped in its conventional attitude. The variations in packing materials, rigging techniques, and item orientation may require a large number of test samples to assure confidence in the test results.

There are four types of airdrops currently employed for airdrop qualification tests of supplies and equipment. The type used depends upon the operational mode summary/mission profile, design, and packaging of the test items. The types are:

1. Low-Velocity Airdrop. The delivery of supplies and equipment from an aircraft in flight using low-velocity cargo parachutes attached to the load to obtain a maximum rate of descent of 28.5 FPS. Impact accelerations of this type of airdrop are 40 to 50 g's.

2. High-Velocity Airdrop. The delivery of supplies and equipment from an aircraft in flight using high-velocity cargo parachutes attached to the load to obtain a rate of descent of 40 to 90 FPS. Impact accelerations are 120 to 150 g's.

3. Free Drop (simulated parachute malfunction). The delivery of supplies and equipment from an aircraft in flight without parachutes attached to the load. Loads are rigged for low-velocity drops and allowed to free-fall from the aircraft to ground impact to simulate a complete parachute malfunction.

4. Low-Altitude Parachute Extraction (LAPE). The delivery of supplies and equipment from a USAF C-130 cargo aircraft flying 5 to 10 ft AGL at 130 KIAS. The loads are rigged on metal airdrop platforms and extracted from the aircraft by extraction parachute(s) attached to the load. Vertical impact velocities are from 15 to 22 FPS, and impact accelerations are from 40 to 120 g's.

There are three methods of airdrop used for airdrop qualification of explosive materiel. The method is again dependent upon the operational mode

summary/mission profile of the test items and their type of packaging. The methods are:

1. Door Loads. A method where the rigged loads are pushed or skidded out of the parachutist door or off the cargo ramp of the aircraft. The packaged test items are rigged in an A-7A cargo sling for low-velocity, high-velocity, or intentional parachute malfunction types of airdrop. The maximum allowable size of a door load is 48 in. long, 30 in. wide, and 66 in. high, including the cargo parachute(s). The minimum allowable weight of a door load is 28 lb/ft^2 of the largest surface of the load, excluding parachute(s). The maximum total allowable weight is 500 lb, excluding the cargo parachute(s). See FM 10-501/T.O. 13C7-1-11[22].

2. Gravity. A method in which the rigged loads roll across roller conveyors inside the aircraft and out of the rear cargo doors. The packaged test items are rigged in an A-22 cargo bag for low-velocity, high-velocity, or intentional parachute malfunction types of airdrop. The maximum allowable size of the A-22 cargo bag is 48 in. long, 53 1/2 in. wide, and 100 in. high including the cargo parachute(s). The minimum allowable rigged weight is 28 lb/ft^2 of the largest surface of the load, excluding parachutes. The maximum total allowable weight is 2,200 lb, excluding the cargo parachute(s).

3. Extraction. A method in which the test items are rigged on metal airdrop platforms that are 108 in. wide and in varying lengths of 8, 12, 16, 20, 24, 28, or 32 ft. The rigged load is extracted from the aircraft by extraction parachute(s). Low-velocity and LAPE types of airdrop use this method of airdrop. The maximum rigged load height is 100 in. Rigged load weight limitations for a low-velocity airdrop are 2,520-lb minimum and 35,765-lb maximum. Rigged load weight limitations for a LAPE airdrop are 6,700-lb minimum and 37,175-lb maximum. See FM 10-500/T.O. 13C7-1-5[23].

Airdrop tests of explosive materiel are not rigged on airdrop platforms for low-velocity drops unless the item's packaged size and weight exceed the A-22 cargo bag limitations.

USAF safety regulations require that a minimum of three intentional parachute malfunction airdrop tests be conducted on explosive materiel before LAPE airdrop tests. If a test item detonates at ground impact during any of the intentional malfunction tests, the item is disqualified for LAPE airdrop.

APPENDIX B

REQUIRED PUBLICATIONS

1. USAF MAC Regulation 3-3, Combat Control Team Operations and Procedures, 12 April 1983, C-3, 30 April 1985.

2. AR 385-16, System Safety Engineering and Management, 20 November 1986; AMC Supplement, 1 December 1986.

3. AR 70-47, Research, Development, and Acquisition. Engineering for Transportability, 19 August 1985.

4. TOP 1-1-012, Classification of Deficiencies and Shortcomings, 1 April 1979; C-1, 4 November 1981; C-2, 26 November 1982.

5. ITOP 1-2-500, Transportability, 7 February 1973; C-1, 22 July 1976; C-2, 24 August 1976; C-3, 20 March 1979.

6. TOP 1-2-511, Electromagnetic Radiation Effects and/or Hazards Test, October 1983.

7. TOP 3-1-002, Confidence Intervals and Sample Size, 25 January 1967.

8. TOP 4-2-502, Safety Evaluation of Mines and Demolitions, 5 May 1978.

9. TOP 4-2-504, Safety Testing of Artillery, Mortar, and Recoilless Rifle Ammunition, 1 April 1979; C-1, 31 October 1979.

10. ITOP 4-2-504(1), Safety Testing of Field Artillery Ammunition, 27 June 1986.

11. ITOP 4-2-504(2), Safety Testing of Tank Ammunition, 21 June 1985.

12. ITOP 5-2-619, Safety Testing of Missile and Rocket Systems, 15 January 1986.

13. TOP 7-2-506, Airdrop Systems Safety, 1 March 1989.

14. TOP 7-2-509, Airdrop, 20 January 1989.

15. TOP 7-2-512, Simulated Airdrop Test - Weapons and Individual Equipment, 3 November 1978.

16. ASD-TM-ENE-77-1, Technical Memorandum: Criteria for Nonstandard Airdrop Loads, Aerial Delivery and Parachute Branch, Crew Systems Division, Directorate of Support Systems Engineering, Wright-Patterson Air Force Base, Ohio, 45433, December 1977 with change 2 dated December 1983.

17. MIL-STD-461B, Electromagnetic Emission and Susceptibility Requirements for the Control of Electromagnetic Interference, 1 April 1980.

18. MIL-STD-1512, Electroexplosive Subsystems, Electrically Initiated, Design Requirements and Test Methods, 21 March 1972.

19. MIL-STD-6051E, Electromagnetic Compatibility Requirements, Systems, 7 September 1967.

20. AR 200-2, Environmental Quality; Environmental Effects of Army Actions, 23 December 1988.

21. AR 380-5, Department of the Army Information Security Program, 15 February 1985; AMC Supplement, 15 February 1985.

22. FM 10-501/T.O. 13C7-1-11, Airdrop of Supplies and Equipment: Rigging Containers, October 1987.

23. FM 10-500/T.O. 13C7-1-5, Airdrop of Supplies and Equipment: Rigging Platforms, 7 October 1987.

PUBLICATIONS FOR INFORMATION ONLY

a. MIL-STD-669A, Loading Environment and Related Requirements for Platform Rigged Airdrop Materiel, August 1968.

b. MIL-STD-462, Electromagnetic Interference Characteristics, Measurements of, 31 July 1967.

c. MIL-STD-209G, Slinging and Tiedown Provisions for Lifting and Tying Down Military Equipment, 4 October 1986.

d. MIL-STD-814B, Requirements for Tiedown, Suspension and Extraction Provisions on Military Materiel for Airdrop, 10 June 1983.

e. T.O. 1C-130A-9, Loading Instructions, USAF Series C-130 Aircraft, 2 May 1977.

f. T.O. 1C-141B-9, Loading Instructions, USAF Series C-141B Aircraft, 1 May 1984.